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CLAIMS

I claim:

Claims 1 - 36(**canceled**)

37.(**withdrawn**) A circular extrusion die comprising

distribution section for forming at least a first molten polymer material into a generally even circular flow, and

bodily separate from said distribution section an exit section comprising an annular main channel with generally cylindrical or conical walls for receiving said generally circular flow of said first polymer material and conducting the same to an annular exit orifice to exit there from as a tubular film structure,

said exit section also comprising a channel system spaced radially from said main channel for extrusion from the circumference of said exit section of a circular array of narrow strands of a second molten polymer material,

said channel system ending in a circular row of internal orifices opening into a circular wall portion of the main channel upstream of said exit orifice so that said circular array of said second polymer material merges with the circular flow of said first polymer material as circumferentially spaced strands superimposed on said circular flow.

38.(**withdrawn**) A circular extrusion die according to claim 37 wherein said channel system for said circumferential extrusion begins at at least one inlet in said exit section and comprises

for delivering said second polymer material to each said internal orifice a labyrinthine sub-channel system communicating at one end with such inlet and at the other end with the respective internal orifice,

said sub-channel system comprising at least three channel-branchings between said ends to promote a balanced division of polymer flow to said internal orifices.

Claims 39 - 73(**canceled**)

74.(**withdrawn**) A circular extrusion die according to claim 38 which further comprises a small circumferential channel in said wall portion of said circular main channel upstream of the exit thereof, said internal orifices opening in common into said small channel.

75.**(withdrawn)** An extrusion die according to claim 37 which further comprises an additional circular channel for extruding a circular flow of a third molten polymer material on the side of said generally circular flow of said first polymer material facing said circular array of narrow strands of said second material upstream of the point where the circular array merges with first circular flow to thereby form on the first circular flow of said first polymer material a continuous layer of said third polymer material underlying said circular array of narrow strands upon its merger with the first circular flow.

76.**(canceled)**

77.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118 wherein:

the pattern of the discontinuous layer of the film A comprises at least one first array of substantially parallel strands,

the pattern of the discontinuous layer of the film B comprises at least one second array of substantially parallel strand, and

the strong bonds comprise crossing points of the two arrays formed by direct lamination ~~the strands in the respective arrays are in contact with one another at their crossing points and are of a polymer material such as to be directly laminated to each other at said crossing points~~.

78.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~119, wherein:

~~T~~the polymer material of the ~~strands of at least one of said arrays~~ discontinuous layer of at least one of the films A and B comprises coloration material in an ~~sufficient~~ amount, a coloration, or an amount and coloration sufficient to render the ~~strands~~ at least one colored discontinuous layer visible through at least one side of the cross-laminate.

79.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein:

~~the~~ a thickness of the discontinuous layers ~~strands in the first surface layer of each~~ of ~~said~~ the films A and B ~~is~~ are not greater than 20% of ~~the~~ a thickness of their respective films.

80.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein:

~~the~~ a collective area of the discontinuous layers of the films A and B comprises ~~strands in each of said first surface layers constitutes not~~ no more than 60% of ~~the~~ a surface area of ~~the~~ their respective film sides.

81.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein ~~the~~ a thickness increase in each of ~~said~~ the films A and B at the locations where the ~~strands~~ discontinuous layers are present is at most 20% of ~~the~~ a film thickness in adjacent ~~strand-free~~ regions ~~thereof~~ where the discontinuous layer are absent.

82.**(currently amended)** The ~~A~~ A cross-laminate according to claim ~~76~~77, wherein ~~the~~ a distance from ~~the~~ a center-to-center of adjacent pairs of strands in each array is between 2 mm and 40 mm.

83.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~119, wherein:

~~the lamination~~ a strength ~~at said crossing points of the thin strands of said arrays is~~ of the strong bonds are at least 40 g cm^{-1}, as measured by a peel test carried out on narrow specimens of the cross-laminate at a velocity of about 1 mm sec^{-1}, and

~~and the lamination~~ a strength ~~in the strand-free regions is~~ of the weak bonds are less than or equal to ~~at the highest~~ 75% of the ~~bonding~~ strength of the strong bonds ~~between the strands at said the crossing points~~, as measured by ~~said~~ the peel test.

84.**(canceled)**

85.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~84, ~~which comprises~~ wherein:

~~on at least one of its outer films, a coextruded~~ an exterior layer formed on an exterior surface of at least the film B or the second B film ~~layer of~~ comprising a polymer material adapted to enhance a surface property of the laminate, where the property is selected from the group consisting of its heat-sealing capability ~~or~~ and its frictional ~~properties~~ property.

86.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein:

the main layer of each of ~~said~~ the two films A and B consists essentially of polyethylene or polypropylene.

87.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~119, wherein:

~~in each of said films A and B:~~

the main layers ~~is~~ are selected from the group consisting of HDPE, LLDPE or a blend of the two,

the ~~continuous second surface~~ bonding layers ~~is formed mainly of~~ comprise LLDPE in admixture with 5 - 25% of a copolymer of ethylene having a melting point or a melting range within the temperature range of 50 - 80°C, and

the ~~strands in the first surface layers of said~~ ~~the films is~~ discontinuous layers comprise ~~selected from~~ a polymer ~~which consists~~ consisting essentially of a copolymer of ethylene having a melting point or a melting range within the temperature range of 50 - 100°C or a blend of such copolymer and LLDPE containing at least 25% of the ~~said~~ the copolymer.

88.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~77~~87, wherein:

~~said~~ the bonding ~~second surface~~ layers includes an adhesion modifying material to ~~establish a blocking between the contacting mutually facing strand-free regions thereof~~ to aid in adhesion of the weak bonds.

89.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~77, wherein:

the pattern of the discontinuous layer ~~the first surface layer on at least one~~ of ~~said~~ the films A and B comprises at least two of ~~said~~ arrays of strands,

at least one of ~~said~~ the two arrays of strands being formed of a polymer material differing in appearance from the ~~another~~ of ~~said~~ the two arrays of strands and

where the strands of the ~~differing~~ two arrays ~~being~~ are interspersed ~~with one another~~.

90.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein:

~~said first surface layer on~~ the discontinuous layers of each of the films A and B constitutes at their highest 10% of ~~the volume~~ a height of their corresponding film.

91.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein: ~~the~~ an average melting point of the polymer material ~~which constitutes~~ of the ~~strand-formed first layer~~ discontinuous layer of each of ~~said~~ the films A and B is at least about 10°C lower than ~~the~~ an average melting point of the polymer material of the ~~the~~ main layer of each of the films A and B.

92.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein: ~~the~~ an average melting point of the polymer material ~~which constitutes~~ of the ~~strand-formed first layer~~ discontinuous layer of each of ~~said~~ the films A and B is at least about 15°C lower than ~~the~~ an average melting point of the polymer material of the ~~the~~ main layer of each of the films A and B.

93.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, ~~which~~ further ~~comprises~~ comprising: a continuous ~~extrusion lamination~~ bonding layer ~~introduced between said films A and B to laminate said films in said sandwich relation~~ interposed between the main layer and the discontinuous layer of at least one of the films A and B.

94.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein: ~~the~~ a thickness of the ~~strands in said first surface layer~~ discontinuous layers of each of ~~said~~ the films A and B ~~is~~ are not greater than 10% of ~~the~~ a thickness of their respective film.

95.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein ~~the~~ a thickness increase of each of ~~said~~ the films A and B at the locations where the ~~strands are~~ discontinuous layer is present is at most 10% of ~~the~~ a film thickness in ~~strand-free~~ regions of the films free of the discontinuous layer.

96.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~119, wherein: ~~the lamination~~ a strength of the weak bonds is no ~~in said strand-free regions of said cross-laminate is not~~ more than 50% of ~~the lamination~~ a strength of the strong bonds ~~at said crossing points of the strands thereof~~, as measured by a peel test carried out on narrow specimens of the cross-laminate at a velocity of about 1 mm sec^{-1}.

97.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~78, wherein the cross-laminate has ~~having~~ a thickness at ~~the highest~~ its thickest of about 0.3 mm, and:

wherein ~~a said film A is situated at one of its sides,~~

~~said film A having its~~ an exterior surface of the film A is corrugated to form a visible pattern of striations extending in one direction,

~~with the~~ where a spacing of ~~said~~ the striations ~~in said pattern~~ being at most about 3 mm,

the main layer and ~~said second surface~~ the bonding layer of ~~said~~ the film A are substantially transparent to enable the ~~coloured~~ colored strands to be visible when the laminate is observed from ~~an A-side~~ one of the exterior surfaces of the cross-laminate, and

~~the~~ a depth of the corrugations is sufficient to impart a three-dimensional effect to ~~said~~ the cross-laminate such that the strands appear to be spaced internally from the exterior surface of ~~said~~ the film A a distance substantially greater than ~~the~~ an actual maximum thickness of ~~said~~ the film A.

98.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein:

~~said first surface layer on~~ the discontinuous layers of each of the films A and B constitutes at their highest 5% of ~~the volume~~ a height of their corresponding film

99.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein:

the average melting point of the polymer material which constitutes the strand-formed first surface layer of each of ~~said~~ the films A and B is at least about 20°C lower than the average melting point of the polymer material which constitutes the main layer thereof.

100.**(currently amended)** The ~~A~~ cross-laminate according to claim ~~76~~118, wherein the distance from center-to-center of adjacent strands of each ~~said~~ the first surface layer is not greater than 20 mm.

101.**(previously presented)** A method of manufacturing a cross-laminate comprising at least two polymer films A and B which comprises:

separately forming each of ~~said~~ the at least two films A and B by coextruding:

a main layer of a polymer material selected to give high tensile strength,

a discontinuous first surface layer of a different polymer material forming an array

of thin strands extending in the direction of extrusion and

interposed between ~~said~~ the main layer and its first surface layer a continuous second surface layer of a different polymer material

and imparting to each of ~~said~~ the polymer films a uniaxial or unbalanced biaxial molecular orientation;

bringing ~~said~~ the films A and B together in sandwich relation with ~~said~~ the main directions of orientation in crossing relation with the ~~said~~ the arrays on mutually facing sides of ~~said~~ the films and the directions of the strands in ~~said~~ the arrays in crossing relation and

laminating ~~said~~ the films A and B together at least partly by heating to form a laminate;

selecting the polymer material of ~~said~~ the continuous second layers to control the lamination strength in the strand-free regions thereof; and

selecting the polymer material of the strands of the each such array to control the lamination strength at the crossing points of the strand arrays such that the lamination strength is highest at the strand crossing points.

102.**(currently amended)** The ~~A~~ method according to claim 101 wherein:

at least one of ~~said~~ the films A or B is coextruded as a tubular film,

orientation is imparted to ~~said~~ the tubular film by drawing down the same while twisting to give a helical direction of orientation thereto,

and comprising the further step of:

subsequently cutting open ~~said~~ the tubular film at an angle to the main direction of orientation and to the direction of ~~said~~ the array of strands thereof.

103.**(currently amended)** The ~~A~~ method according to claim 101 wherein:

at least one of ~~said~~ the films A and B is coextruded in a circular coextrusion die in tubular form with a circumference at the exit of ~~said~~ the die of at least 20 cm, and

the first surface layer thereof is coextruded discontinuously so that the distance from center-to-center of adjacent strands in the tubular film at the exit from ~~said~~ the die is at the highest 4 cm.

104.**(currently amended)** The ~~A~~ method according to claim 101 which comprises the further step of:

after ~~said~~ the films are brought together in ~~said~~ the sandwich arrangement and before, after or simultaneously with their being laminated together, stretching ~~said~~ the films in their longitudinal or transverse directions or both to further orient the same.

105.**(previously presented)** The method according to claim 101 wherein:

~~said~~ the films A and B are brought together in ~~said~~ the sandwich relation with ~~said~~ the strand arrays in direct contact to be directly sealed together upon lamination.

106.**(previously presented)** The method according to claim 101 wherein:

film A is coextruded as a five-layer assembly

having ~~said~~ the main layer

with at least one of ~~said~~ the first surface layers and

a second surface layer coextruded on both of the opposite sides of ~~said~~ the main layer; and

~~said~~ the five-layer film A is brought together with a ~~said~~ the film B on each of its opposite sides

so arranged that the arrays of strands of the first surface layer of each ~~said~~ the film B are in crossing relation with an array of strands of a first surface layer of ~~said~~ the film A proximate thereto.

107.**(currently amended)** The ~~A~~ method according to claim 101 wherein:

at least one additional film C is brought together with at least one of ~~said~~ the films A and B on a side opposite ~~said~~ the strand array of the latter,

~~said~~ the film C comprising:

a main layer of a polymer material selected to give high tensile strength and

a continuous surface layer of a different polymer material on the side thereof facing ~~said~~ the at least one of ~~said~~ the films A and B,

the polymer material of ~~said~~ the continuous surface layer being adapted when the films are is laminated to produce a higher lamination strength of ~~said~~ the film C with ~~said~~ the opposite side of ~~said~~ the at least one of films A and B than the lamination strength between films A and B in the strand-free regions thereof.

108.**(currently amended)** The ~~A~~ method according to claim 101 wherein:

the separate coextrusions of ~~said~~ the films A and B are so controlled that the relative rates of extrusion flow of the polymeric materials of ~~said~~ the main, second and first surface layers of ~~said~~ the films A and B are such that ~~said~~ the first surface layer on each of the films A and B constitutes at the highest 10% of the volume of the respective film A or B.

109.**(currently amended)** The ~~A~~ method according to claim 101 wherein:

the average melting point of the polymer material of ~~said~~ the strand-formed first surface layer of each of ~~said~~ the films A and B is at least about 10°C lower than the average melting point of the polymer material of the main layer thereof.

110.**(previously presented)** The method according to claim 101 wherein the polymer material of the strand-formed array of at least one of ~~said~~ the films A and B comprises coloration material in sufficient amount and/or coloration to render the strands visible through at least one side of the cross-laminate.

111.**(currently amended)** The ~~A~~ method according to claim 101 wherein:

the polymer materials of ~~said~~ the main layer and ~~said~~ the second continuous layer of ~~said~~ the film A are sufficiently transparent to render the strands of ~~said~~ the first surface layer thereof visible therethrough, and

coextrusion conditions for the respective films are controlled so that the general thickness of the final laminate is not more than about 0.3 mm, which further comprises:

embossing at least the exterior surface of ~~said~~ the film A into corrugations forming a pattern of striations extending in one direction with corresponding thickness variations in ~~said~~ the film,

the separation between the striations in ~~said~~ the pattern being not more than about 3 mm and

the depth of the corrugations being sufficient to impart a three-dimensional effect to the cross-laminate such that the strands when viewed from the A-side appear to be spaced internally from the exterior surface of ~~said~~ the film a distance substantially greater than the actual maximum thickness of ~~said~~ the film A.

112.**(currently amended)** The ~~A~~ method according to claim 111 wherein: ~~said~~ the embossing is carried out by:

passing ~~said~~ the films A and B after they have been brought together in sandwich relation and:

before or after ~~said~~ the films have been laminated through at least one pair of mutually intermeshing grooved rollers to form ~~said~~ the corrugations while simultaneously effecting a transverse stretching of the same.

113.**(currently amended)** The ~~A~~ method according to claim 101 wherein:

the separate coextrusions of ~~said~~ the films A and B are so controlled that the relative rates of extrusion flow of the polymeric materials of ~~said~~ the main, second and first surface layers of ~~said~~ the films A and B are such that ~~said~~ the first surface layer on each of the films A and B constitutes at the highest 5% of the volume of the respective film A or B.

114.**(currently amended)** The ~~A~~ method according to claim 101 wherein~~;~~:

the average melting point of the polymer material of ~~said~~ the stand-formed first layer of each of ~~said~~ the films A and B is at least about 20°C lower than the average melting point of the polymer material of the main layer thereof.

115.**(currently amended)** The ~~A~~ method according to claim 102 wherein:

~~said~~ the first surface layer of ~~said~~ the tubular film is coextruded discontinuously so that the distance from center-to-center of adjacent strands thereof is at most 20 mm.

116.**(currently amended)** The ~~A~~ method according to claim 101 wherein: ~~said~~ the laminating comprises:

extruding between ~~said~~ the films A and B an intermediate layer of a molten polymer material selected to effect lamination of the films as they are brought together in sandwich relation and cooled.

117.**(currently amended)** The ~~A~~ method according to claim 101 which further comprises

coextruding at least one of ~~said~~ the films A and B with a ~~said~~ the discontinuous surface layer

on both of its sides,

separately coextruding a film C having a ~~said~~ the main layer with a ~~said~~ the first discontinuous surface layer and a ~~said~~ the second continuous surface layer on at least one of its sides and

laminating ~~said~~ the film C to an exterior side of at least one of ~~said~~ the films A and B with the first surface layer of film C facing ~~said~~ the exterior side before, during or after films A and B are brought together in ~~said~~ the sandwich relation to laminate the ~~said~~ the films A, B and C together,

the polymer material of the surface layer of ~~said~~ the film C being selected in association with the lamination conditions to produce a stronger lamination at the crossing points of the strands of its first surface layer and the strands of the adjacent first surface layer of ~~said~~ the film A or B than in the strand-free regions thereof.

118.(**new**) A cross-laminate comprising:

a first coextruded film A having a main direction of molecular orientation and including:

a continuous main layer comprising a polymer material having a high tensile strength,

a patterned discontinuous layer disposed on a surface of the main layer, where the discontinuous layer comprises a different polymer material,

a second coextruded film B having a main direction of molecular orientation and including:

a continuous main layer comprising a polymer material having a high tensile strength,

a patterned discontinuous surface layer disposed on a surface of the main layer, where the discontinuous layer comprises a different polymer material,

where the film B is arranged so that the main direction of the film B crosses the main direction of the film A and the pattern of the discontinuous layer of the film B crosses the pattern of the discontinuous layer of the film A, and

strong bonds bonding the films together at intersections of the pattern of the discontinuous layer of the film A and the pattern of the discontinuous layer of the film B,

where the films A and B are either uniaxially or unbalanced biaxially molecularly oriented.

119.(**new**) The cross-laminate according to claim 118, further comprising:

a continuous bonding layer interposed between the main layer and the discontinuous layer of each of the films A and B and

weak bonds formed between the bonding layers of the films A and B in regions of the films free of the discontinuous layers.

121.**(new)** The cross-laminate according to claim 118, further comprising:

moderate bonds formed between the bonding layer of one the films A or B and the discontinuous layer of the other film B or A.

122.**(new)** A cross-laminate according to claim 118, wherein:

the film A further including a patterned second discontinuous layer disposed on a second surface of the main layer, where the second discontinuous layer comprises a different polymer material, and

the cross-laminate further comprising:

a second B film arranged so the main direction of the second B film crosses the main direction of the film A and the pattern of the discontinuous layer of the second B film crosses the pattern of the second discontinuous layer of the film A,

second strong bonds bonding the second B film to the film A together at intersections of the pattern of the second discontinuous layer of the film A and the pattern of the discontinuous layer of the second B film ,

where the second B film is either uniaxially or unbalanced biaxially molecularly oriented.

123.**(new)** The cross-laminate according to claim 120, further comprising:

a continuous bonding layer interposed between the main layer and the discontinuous layer of each of the film A, the B film and the second B film and

weak bonds formed between the bonding layers of the films A and B and the films A and the second B film in regions of the films free of the discontinuous layers.